



JAMES CITY COUNTY ENVIRONMENTAL DIVISION

Chesapeake Bay Ordinance Guidance for Determining Water Bodies with Perennial Flow

Purpose

This document provides guidance on the requirements of the Chesapeake Bay Preservation Ordinance for determining the extent of Resource Protection Areas (RPAs) based on the presence of water bodies with perennial flow. The purpose of this guidance is to provide information on the methods for evaluating stream flow, especially the field indicator protocol methods, that may be used for determining whether a stream is perennial.

Water body with perennial flow. A water body that flows in a natural or man-made channel year round during a year of normal precipitation. It includes but is not limited to streams, estuaries, tidal embayments, and may include drainage ditches or channels constructed in wetlands or from former natural drainageways, which convey perennial flow. Lakes and ponds through which a perennial stream flows are part of the perennial stream.

Ordinance Requirements

Section 23-10(2)d requires submission of “a reliable, site specific evaluation to determine whether water bodies on or adjacent to the proposed development site have perennial flow.” The evaluation is to be provided by the person applying to use or develop the property using one of the County or state approved methods of in-field indicators of perennial flow unless the County has already made a field determination of perennial flow for the property. These determinations shall be confirmed by the County and be used to establish the boundaries of the RPA. The Environmental Division’s target for confirming determinations submitted for any project other than a single family lot is 21 days from receipt of all information necessary to substantiate the perennial flow determination.

This evaluation is required to be submitted for any development or redevelopment project as part of the County’s Plan of Development Process. Therefore, before approval of any site or subdivision plan, the issuance of a building permit for construction of a single family residential structure, an addition to an existing residential structure, an accessory structure, or prior to any clearing or grading of a lot, a perennial stream evaluation must be submitted.

It is strongly recommended that the perennial stream determination be conducted and submitted to the Environmental Division as soon as possible in the planning process. This will prevent costly delays and reengineering of projects resulting from the unknown presence of perennial streams and required buffers. Due to the impact that perennial streams and associated RPA buffers can have on a project’s layout and design, County approved stream determinations will remain in effect for a minimum of 5 years or for the duration of the plan approval for a given project, whichever is necessary. Issues related to the application of the revised Ordinance to previously approved plans will be based on the *Chesapeake Bay Preservation Ordinance*

Transition – Amendments and Grandfathering/Vesting Rules resolution adopted by the Board of Supervisors on November 25, 2003.

Approved Methods for Determining Perennial Flow

The determination of a water body with perennial flow shall be accomplished through the use of a reliable, site-specific evaluation of in-field indicators of perennial flow unless the County has already made a field determination of perennial flow for the site. This site-specific evaluation shall be accomplished using one of the following five County or state approved methods:

1. North Carolina Field Indicator Method;
2. Fairfax County Field Indicator Method;
3. Groundwater Monitoring;
4. Surface Water Monitoring;
5. Documented Observation.

A discussion of these methods is contained in a guidance document entitled *Determinations of Water Bodies with Perennial Flow* adopted by the state's Chesapeake Bay Local Assistance Board (CBLAB) in September, 2003. The guidance document presents an overview of the various determination methods and the general requirements for each method.

Of the five methods, it is anticipated that majority of the site and subdivision plans will utilize one of the Field Indicator methods while most of the single family projects will utilize the Documented Observation method. The County has prepared a separate document entitled *Chesapeake Bay Ordinance Submission Requirements for Single Family Site Plans* that provides detailed information regarding the Documented Observation Method. Therefore, the remainder of this document will provide guidance regarding the field indicator methods.

Field Indicator Protocols

The use of field indicator protocols entails the evaluation of observations made of stream geomorphology, hydrology, and biology. The Chesapeake Bay Local Assistance Department (CBLAD) has reviewed and found two field indicator protocols, field-tested in Virginia and North Carolina, to be acceptable for making site-specific determinations. The first is a method developed by the North Carolina Division of Water Quality (Version 2.0, January 2000 and Draft Internal Policy January 16, 2003). The second is a modification of the North Carolina method developed by Fairfax County, Virginia. Documentation is available on the CBLAD website <http://www.cblad.state.va.us/perstream.cfm> regarding both these protocols including field data sheets. The website also contains guidance manuals for both methods that include the definition of all the terms and the various field indicators used in the data sheets. For convenience, data sheets for both methods are attached to this memo and copies of the two guidance manuals are available from the Environmental Division.

The North Carolina and Fairfax County evaluation protocols are both numerical rating systems that involve assigning point values to various stream characteristics. The determination between a perennial and non-perennial stream is based on the evaluation of a combination of hydrological, physical and biological characteristics of the stream. Field indicators of these characteristics are classed as primary or secondary and ranked using a weighted, four-tiered scoring system. The ranking of the various indicator scores are then totaled and compared to a

threshold value determined to be generally indicative of perennial flow conditions. For James City County, the perennial threshold values are 28 for the North Carolina method and 24 for the Fairfax County method. While general consistency of application of the protocols among trained individuals has been noted, it needs to be recognized the when the score is within 3 points of the threshold value for either method, it is possible that the determination may not be strictly made based on the threshold value. For example, a stream may be determined to be perennial with a score of 25 or intermittent with a score of 31 if a preponderance of the evidence and professional judgment indicate that it is the appropriate determination.

Information to be submitted to the Environmental Division for evaluation of the field indicator methods includes at a minimum maps and pictures showing the location of the data points, the completed data sheets for each point evaluated, and any field logs or notes.

Inability to Collect Field Data

All methods approved for making site-specific determinations of perennial flow require that information on the water body be collected in the field. There may be some situations where a water body that needs to be evaluated is not located on property owned by the applicant for a development project. In the event that the person conducting the evaluation is not able to obtain permission from a landowner to access the water body in question for the purpose of collecting data necessary to make a site-specific evaluation, then the best available information from other sources can be substituted for evaluation purposes. Other data sources that contain valuable information include but are not limited to the *Soil Survey of James City and York Counties and the City of Williamsburg, Virginia* (1985), *National Wetlands Inventory* maps, geographic information and aerial photography available from James City County, and data collected upstream and downstream of the location that cannot be accessed. This information will then be used by the Environmental Division to make the decision regarding a water body's perennial flow status.

NCDWQ Stream Classification Form

Project Name: _____ River Basin: _____ County: _____ Evaluator: _____

DWQ Project Number: _____ Nearest Named Stream: _____ Latitude: _____ Signature: _____

Date: _____ USGS QUAD: _____ Longitude: _____ Location/Directions: _____

PLEASE NOTE: If evaluator and landowner agree that the feature is a man-made ditch, then use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream—this rating system should not be used

Primary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Riffle-Pool Sequence?	0	1	2	3
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	2	3
3) Are Natural Levees Present?	0	1	2	3
4) Is The Channel Sinuous?	0	1	2	3
5) Is There An Active (Or Relic) Floodplain Present?	0	1	2	3
6) Is The Channel Braided?	0	1	2	3
7) Are Recent Alluvial Deposits Present?	0	1	2	3
8) Is There A Bankfull Bench Present?	0	1	2	3
9) Is A Continuous Bed & Bank Present?	0	1	2	3
<i>(NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0)</i>				
10) Is a 2 nd Order Or Greater Channel (As Indicated On Topo Map And/Or In Field) Present?	Yes=3		No=0	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: _____

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/Discharge Present?	0	1	2	3

PRIMARY HYDROLOGY INDICATOR POINTS: _____

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present In Streambed?	3	2	1	0
2) Are Rooted Plants Present In Streambed?	3	2	1	0
3) Is Periphyton Present?	0	1	2	3
4) Are Bivalves Present?	0	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: _____

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	.5	1	1.5
2) Is There A Grade Control Point In Channel?	0	.5	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	.5	1	1.5

SECONDARY GEOMORPHOLOGY INDICATOR POINTS: _____

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (Or Last Year's) Leaf litter Present In Streambed?	1.5	1	.5	0
2) Is Sediment On Plants (Or Debris) Present?	0	.5	1	1.5
3) Are Wrack Lines Present?	0	.5	1	1.5
4) Is Water In Channel And >48 Hrs. Since Last Known Rain? <i>(NOTE: If Ditch Indicated In #9 Above Skip This Step And #1 Below*)</i>	0	.5	1	1.5
5) Is There Water In Channel During Dry Conditions Or In Growing Season?	0	.5	1	1.5
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	Yes=1.5		No=0	

SECONDARY HYDROLOGY INDICATOR POINTS: _____

III. Biology	Absent	Weak	Moderate	Strong		
1) Are Fish Present?	0	.5	1	1.5		
2) Are Amphibians Present?	0	.5	1	1.5		
3) Are Aquatic Turtles Present?	0	.5	1	1.5		
4) Are Crayfish Present?	0	.5	1	1.5		
5) Are Macroinvertebrates Present?	0	.5	1	1.5		
6) Are Iron Oxidizing Bacteria/Fungus Present?	0	.5	1	1.5		
7) Is Filamentous Algae Present?	0	.5	1	1.5		
8) Are Wetland Plants In Streambed?	SAY 2	Mostly OBL 1	Mostly FACW .75	Mostly FAC .5	Mostly FACU 0	Mostly UPL 0

(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAY Present)*

SECONDARY BIOLOGY INDICATOR POINTS: _____

TOTAL POINTS (Primary + Secondary) = _____ *(If Greater Than Or Equal To 12 Points The Stream Is At Least Intermittent)*

Fairfax County Stream Classification Form

Site ID: _____

Total Score: _____

Date: _____

Recorder: _____

Time: _____

Evaluators: _____

Field Indicators:

I.) Streamflow and Hydrology	Absent	Weak	Moderate	Strong
1.) Presence or absence of flowing water and > 48 hrs since last rainfall	0	1	2	3
2.) Presence of high groundwater table or seeps and springs	0	1	2	3
3.) Leaf litter in streambed	1.5	1	0.5	0
4.) Drift lines	0	0.5	1	1.5
5.) Sediment on debris or plants	0	0.5	1	1.5

Total Streamflow and Hydrology Points: _____

II.) Geomorphology	Absent	Weak	Moderate	Strong
1.) Riffle-pool sequence	0	1	2	3
2.) Substrate Sorting (USDA texture in streambed)	0	1	2	3
3.) Natural Levees	0	1	2	3
4.) Sinuosity	0	1	2	3
5.) Active or Relic Floodplain	0	1	2	3
6.) Braided Channel	0	1	2	3
7.) Recent Alluvial Deposits	0	1	2	3
8.) Bankfull Bench present	0	1	2	3
9.) Continuous Bed and Bank	0	1	2	3
10.) 2nd order or greater channel present	Yes = 3		No = 0	

Total Geomorphology Points: _____

III.) Streambed Soils				
1.) Redoximorphic features present in sides of channel or head cut.	Present = 0		Absent = 1.5	
2.) Chroma	gleyed = 3	1 = 2	2 = 1	> 2 = 0

Total Streambed Soils Points: _____

IV.) Vegetation	Absent	Weak	Moderate	Strong
1.) Rooted AQUATIC Plants in Streambed	0	1	2	3
2.) Presence of Periphyton/green algae	0	1	2	3
3.) Iron Oxidizing Bacteria/Fungus	0	0.5	1	1.5
4.) Wetland Plants in Streambed (Skip if no plants present in streambed)	SAV = 3 Mostly OBL = 1.5 Mostly FACW = 1		Mostly FAC = 0.5 Mostly FACU, UPL, or None = 0	

Total Vegetation Points: _____

Comments:

Front Page Total _____ points

Benthic Macroinvertebrates	Absent	Weak	Moderate	Strong
Benthic Macroinvertebrates	0	0.5	1	1.5
Bivalves	0	1	2	3
EPT taxa	Present = 3		Absent = 0	

Total Benthic Macroinvertebrates Points: _____

Vertebrates	Absent	Weak	Moderate	Strong
Fish	0	0.5	1	1.5
Amphibians	0	0.5	1	1.5

Total Vertebrates Points: _____

Total Score:

Invertebrates/Amphibians Found:

Weather
 Rain Gauge _____ Date of Last Rainfall _____ Rainfall Amount _____

Reach Description
 Upstream: TRB HCT GRC RCU POF SDO ARB RPA Other: _____
 Downstream: TRB HCT GRC RCU POF SDO ARB RPA Other: _____
 Comments: _____

Stream Network Connections and Watershed Observations

Riparian Buffers Width

LB: Distance >25 feet 26-50 51-75 76-100 100+
 Cover type: Tree Shrub Herbaceous Lawn Other:
 Dominant Species:

RB: Distance >25 feet 26-50 51-75 76-100 100+
 Cover type: Tree Shrub Herbaceous Lawn Other:
 Dominant Species:

Riparian Buffer Comments

Other Observations and Comments:

Is the reach perennial? YES NO

Photo #	Direction (US, DS, LB, RB)	Notes